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Notes on the Tawny-bellied Cotton Rat (*Sigmodon fulviventer*) from Southwestern New Mexico

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Abstract

The Tawny-bellied Cotton Rat (*Sigmodon fulviventer*) is known from central and southwestern New Mexico. Herein, additional information is reported on reproduction, distribution, and other aspects of its natural history from populations in southwestern parts of the state. Habitats at capture sites varied from upland grasslands to lush, marshy habitats, each of which contained dense herbaceous cover. Tawny-bellied Cotton Rats were documented in surface runways during daylight hours and were associated with 11 other species of rodents including the Mexican Woodrat (*Neotoma mexicana*), a species not trapped previously with *S. fulviventer*. Tawny-bellied Cotton Rats captured in southern Catron County along the southern edge of the Mogollon Plateau represent the first captures for the county and northernmost records in the region, whereas captures in northeastern Grant County extend the distribution of the species northward along the Mimbres River. Due to limited trapping in the past, new distributional records are best referred to as range extensions. High population densities of rodents occurred across the region during most of the years of this research. The Tawny-bellied Cotton Rat is a species that can exhibit great fluctuations in density. At its northernmost distributional reaches, individuals might be present only occasionally or become detectable only when populations are dense. A more comprehensive study on *S. fulviventer* is needed in the region to better understand the biology of this grassland species because little is known about the species throughout its distribution in the United States.

Key words: Catron County, Grant County, Luna County, Mimbres River, Mogollon Plateau, New Mexico, population density, range extension, reproduction, *Sigmodon fulviventer*, Tawny-bellied Cotton Rat

Introduction

The Tawny-bellied Cotton Rat (*Sigmodon fulviventer* J. A. Allen, 1889) occurs as disjunct populations in central and southwestern New Mexico (Mohlhenrich 1961; Findley et al. 1975; Geluso et al. 2005). In southwestern New Mexico, *S. fulviventer* is known from Doña Ana, Grant, Hidalgo, Luna, and Sierra counties (Findley et al. 1975; Cook 1986; Geluso 2009a). However, relatively little information is known regarding reproduction or other aspects of the biology of this grassland species in New Mexico as well as elsewhere

in the United States (Mohlhenrich 1961; Findley et al. 1975; Cook 1986; Hoffmeister 1986; Geluso et al. 2005; Geluso 2009a; Schmidly and Bradley 2016). For example, Findley et al. (1975) mention nothing regarding reproduction for the species in New Mexico; Cook (1986) reports on a single pregnant female; and Geluso et al. (2005) and Geluso (2009a) present limited information (6 pregnant females, 1 lactating female, and 3 juveniles). Herein, additional information is reported on reproduction, distribution, and other aspects of natural history from populations of *S. fulviventer* in southwestern New Mexico.

METHODS

While conducting multi-year field studies on small mammals in southwestern New Mexico (Geluso 2016; Geluso and Geluso 2020), a number of *S. fulviventer* were captured that provide additional information for the species in the state. Information in Geluso (2016) refers only to an unpublished final report, and captures of *S. fulviventer* in Geluso and Geluso (2020) are listed in their appendix only because captures occurred in trap lines associated with their focal species, *S. ochrognathus*. In their in-depth report on the natural history of *S. ochrognathus* (Geluso and Geluso 2020), no information was reported on dates of capture, body weight, reproductive status, or specimens for *S. fulviventer*. Nor was there any discussion concerning the new distributional records of *S. fulviventer*. Hence, that information is presented herein, as well as unpublished information from the final report.

Individuals were captured in Sherman live traps (H. B. Sherman Traps, Inc., Tallahassee, FL) baited with a mixture of birdseed and rolled oats and set in various habitats dominated by herbaceous plants. Traps generally were set in the late afternoon and checked the following morning, and at one site, traps also were checked during daylight hours. Information recorded for individuals varied depending on the project, as species, sex, age, and reproductive conditions generally were recorded in notes. For individuals released at capture sites, weights of only some individuals were measured and recorded in notes. Latitude and longitude of localities were determined with a handheld global positioning system (GPS 12, Garmin International, Olathe, Kansas) using North American Datum 1983 (NAD 83). Most animals were released at capture sites. Those kept as voucher specimens were deposited in the Museum of Southwestern Biology (MSB), University of New Mexico, Albuquerque (Appendix). Common and scientific names of mammals herein follow Bradley et al. (2014).

RESULTS AND DISCUSSION

A total of 29 individuals of *S. fulviventer* were captured, including eight from southern Catron County and northwestern Grant County and 21 from northeastern Grant and northern Luna counties along the Mimbres River (Appendix; Fig. 1). Two pregnant females were captured, one on 4 June (6 fetuses) and one on 9 June (4 fetuses). No females were lactating. A small juvenile (16 g) was captured on 26 April, and other juveniles were captured on 10 and 11 June (Appendix). These data are within known dates of reproduction for this species in New Mexico, as pregnant females are known from April, June, July, and December; a lactating female is known from August; and juveniles are known from April, July, and August (Cook 1986; Geluso et al. 2005; Geluso 2009a).

Three individuals were captured during daylight hours around a spring along the edge of the floodplain of the Mimbres River (Site 3; Appendix). Although other species of *Sigmodon* are known to be active during daylight hours (e.g., Hispid Cotton Rats [*S. hispidus*] and Yellow-nosed Cotton Rats [*S. ochrognathus*]; Cameron and Spencer 1981; Geluso and Geluso 2020), observations in this study appear to represent the first documentation of diurnal activity for *S. fulviventer* throughout its distribution.

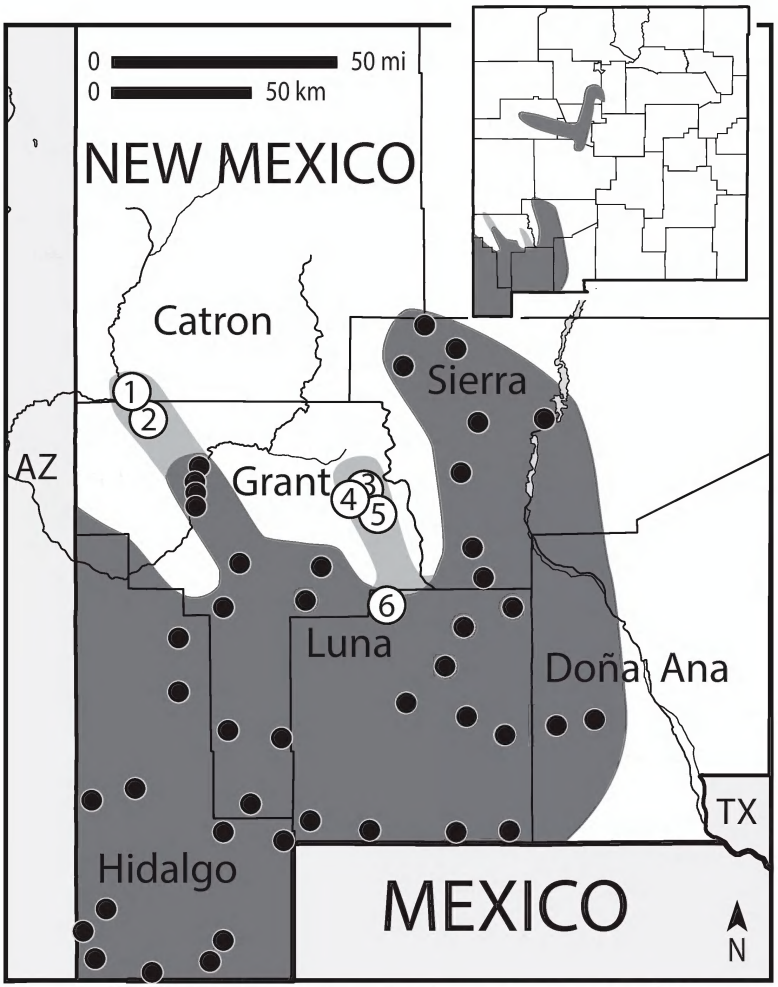

Figure 1. Distribution of the Tawny-bellied Cotton Rat (*Sigmodon fulviventer*) in southwestern New Mexico. Open circles with numbers represent six new localities of occurrence in the region reported herein. Closed circles represent previously published records of *S. fulviventer* in southwestern New Mexico (Findley et al. 1975; Geluso 2009a). The dark shaded area represents the known distribution prior to this study, whereas the light shaded area represents the newly discovered areas occupied by *S. fulviventer* reported in this study. Numbers associated with the open circles correspond to numbers in the Appendix. In the inset, the dark shaded area in central New Mexico represents the distribution reported by Findley et al. (1975) and Geluso et al. (2005). In the inset, the distribution of *S. fulviventer* is shown to occur in southwestern Santa Fe County. In Findley et al. (1975), the locality of occurrence for the single specimen from Santa Fe County was reported incorrectly. The correct locality of occurrence for that specimen is the following: Santa Fe County, 1.1 mi S, 0.6 mi W Golden (personal communication, Kenneth N. Geluso).

Other rodents captured on the same day in trap lines with *S. fulviventer* included the Northern Pygmy Mouse (*Baiomys taylori*), Western White-throated Woodrat (*Neotoma albigula*), Mexican Woodrat (*Neotoma mexicana*), Brush Deermouse (*Peromyscus boylii*), White-footed Deermouse (*Peromyscus leucopus*), North American Deermouse (*Peromyscus maniculatus*), Southern Grasshopper Mouse (*Onychomys torridus*), Western Harvest Mouse (*Reithrodontomys megalotis*), Silky Pocket Mouse (*Perognathus flavus*), *S. ochrognathus*, and S. *hispidus*. Most of these species have been associated with *S. fulviventer* at other sites across its distribution in the United States and Mexico (Baker 1969; Petersen 1973; Baker and Shump 1978; Geluso 2009a). Captures of *N. mexicana* and *P. boylii* in this study were due to the occurrence of grassy habitats adjacent to or within piñon pine and juniper woodlands. Although predominantly montane, captures of *N. mexicana* at a spring with willows occurred at a low elevation of 1,845 m; however, this species has been documented at lower elevations in the Animas Mountains (1,814 m) south of this study site (Cook 1986). Mexican Woodrats have not been documented in trap lines with *S. fulviventer* in the past. Both *N. mexicana* and *P. boylii* likely will not be captured abundantly throughout its range except when grassland and woodland habitats are in close proximity.

Habitats varied across study sites where *S. fulviventer* were captured, but each site was associated with dense herbaceous vegetation. In southern Catron and northwestern Grant counties, traps were in upland grassy areas along roadsides of U.S. Highway 180 (Sites 1 and 2, respectively; Appendix; Fig. 1). The dominant grass was Alkali Sacaton (*Sporobolus airoides*) in Catron County and James' Galleta (*Hilaria jamesii*) in Grant County. All sites along the Mimbres River were in the floodplain containing friable soils. Two of the three northerly sites along the Mimbres River (Sites 3 and 5; Fig. 1) were associated with springs containing dense, lush grasses, rushes, and sedges. At Sites 4 and 6 along the Mimbres River, individuals were captured in old fields with various grasses and forbs. Habitat associations observed in this study from both upland situations and wet, lush habitats are similar to those reported elsewhere in Arizona and New Mexico (Mohlhenrich 1961; Findley et al. 1975; Cook 1986; Hoffmeister 1986; Geluso 2009a).

Captures of *S. fulviventer* reported herein represent two modest extensions in distribution at the northernmost reaches of its range in southwestern New Mexico (Fig. 1). One is from southern Catron County and the other is from along the Mimbres River in northeastern Grant County. Both localities of occurrence help to delineate the distribution of this species in the state (Fig. 1). The seven individuals captured in Catron County represent the first observations for the species in the county. Captures in Catron County represent a 34.5 km range extension from the nearest published record located to the southeast in Grant County (8 km NE Cliff, Lichty Ecological Center, 33°00.936'N, 108°33.205'W; Geluso 2009a). Grassland habitats in southern Catron County lie along the southern edge of the Mogollon Plateau. In the area, grassy habitats occur slightly farther north along the San Francisco River and along some alluvial fans above the river (Geluso and Geluso 2020), but these records herein likely are near the edge of the species' potential distribution in the region due to appreciable elevational and habitat changes associated with the Mogollon Plateau.

More than 20 individuals were captured along the Mimbres River (Appendix; Sites 3–6; Fig. 1). Previously, no records of *S. fulviventer* were known along the river (Findley et al. 1975), although Mohlhenrich (1961) trapped specifically for cotton rats near Faywood in Grant County, likely along the Mimbres River near the Grant-Luna County line. The northernmost record along the Mimbres River (Site 3; Fig. 1) represents a 20.3 km range extension from the nearest published record located to the southwest at Bayard in Grant County (Findley et al. 1975). It appears unlikely that populations from Bayard directly connect to those along the Mimbres River, as generally unsuitable mountainous habitat occurs between the two localities of occurrence. Tawny-bellied Cotton Rats generally inhabit mesquite grasslands and other well-developed grassy habitats at lower elevations and generally do not occur on wooded slopes (Findley et al. 1975; Baker and Shump 1978; Hoffmeister 1986). Populations along the northern parts of the Mimbres River likely are connected to those populations farther south via the lower reaches of the Mimbres River, especially where the river goes underground in flat grasslands north of Deming in Luna County. Continuous suitable habitat appears to quickly cease farther north along the Mimbres River, although

grassy and weedy patches exist farther north along this small, narrow river.

These modest distributional records in southwestern New Mexico are best referred to as range extensions based on definitions described by Frey (2009). In general, relatively little trapping has been conducted in and around study sites reported herein (see Findley et al. 1975). Other studies describing distributional data for mammals in the region have come to the same conclusion, as there is a general lack of prior historical data to ascertain that species did not occur at sites in the past, thus supporting the definition of a range extension (Geluso 2009a,b; Geluso and Geluso 2020). A range expansion, on the other hand, confers that the species of interest has not occurred in the new localities of occurrence in the past and only recently moved into the area (Frey 2009). Frey (2009) uses "background species" to help understand whether new records of mammals are range extensions or expansions. If adequate amounts of trapping have occurred in the past, then other common species (i.e., the background species) that occupy the same general habitats should be known from the area. If background species were present and the species of interest was not, then expansion likely has occurred.

Mohlhenrich (1961) conducted the most thorough survey on the distribution of *S. fulviventer* and *S. hispidus* throughout New Mexico from 1957 to 1959, and he almost certainly set traps in habitats containing mainly herbaceous vegetation. Mohlhenrich (1961: Fig. 1) trapped specifically for *Sigmodon* (1) near Cliff in northern Grant County, (2) in Glenwood in southern Catron County, (3) at an unknown locality between Cliff and Glenwood (likely along US Highway 180), and (4) near Faywood in northeastern Grant County. Each locality is near sites of capture reported herein, and Mohlenrich (1961) reported no captures of *S. fulviventer* from those sites. Mohlenrich (1961) failed to capture any *Sigmodon* near Glenwood, Cliff, and the locality in between, whereas he captured *S. hispidus* near Faywood. To a degree, those data support the possibility that the records of *S. fulviventer* herein might reflect a range expansion. Unfortunately, it is unclear how many individuals of background species were captured, if any, at those locations.

Caution should be acknowledged when trying to determine range extensions or expansions for species prone to extreme fluctuations in population size, such as cotton rats (Dunnum et al. 2002; Rehmeier et al. 2005). Such species are challenging to monitor and understand occurrences at distributional limits (Frey 2009). Examination of population fluctuations with long-term trapping data can help to demonstrate issues with species that experience dramatic population changes. Trapping for small mammals in study areas mentioned herein demonstrated that rodent populations appeared to be high in 2015 and 2016 (Geluso 2016; Geluso and Geluso 2020), which was supported by a long-term ecological study in the Chihuahuan desert ecosystem near Portal in Cochise County, Arizona, about 130 km southwest of study areas reported herein (Ernest et al. 2020). Near Portal, small mammal populations have been monitored monthly since 1977 (Ernest et al. 2020). Total numbers of individuals captured for all species during this > 40-year project were greatest in 2007 and 2015 (Fig. 2), with *S. fulviventer* reaching its all-time highs in 2008 and 2015 (Fig. 3; Ernest et al. 2020). Those data further show examples of how cotton rats have extreme population fluctuations (Fig. 3). For example, total numbers of *S. fulviventer* captured in 2015 (105 individuals) were significantly greater than the species' average (8.8 individuals/year), and there were 30 years without any individuals of *S. fulviventer* captured during the 43 years of monitoring (Fig. 3).

Furthermore, another grassland-obligate species, the Northern Pygmy Mouse (*Baiomys taylori*), showed population highs during three periods (Fig. 4). All years with documented captures of *B. taylori* north of its core range in southern Hidalgo County (1991, 2008, 2009, 2014, and 2015; Stuart and Scott 1992; Geluso et al. 2017) corresponded to periods with known population highs, including 1990–1992, 2007–2009, and 2014–2016 (Fig. 4). This relationship corresponds well with years where the species was documented farther north than previously known.

The study site in Portal, Arizona, is well within the distribution of both these species, yet the long-term dataset demonstrates that for a majority of years between 1977 and 2019, researchers failed to document the species the entire year after trapping once a month yearly. Thus, being cautious of issues using background species with dramatic populations fluctuations and because Mohlhenrich (1961) might have trapped during periods of low densities of *Sigmodon*, records

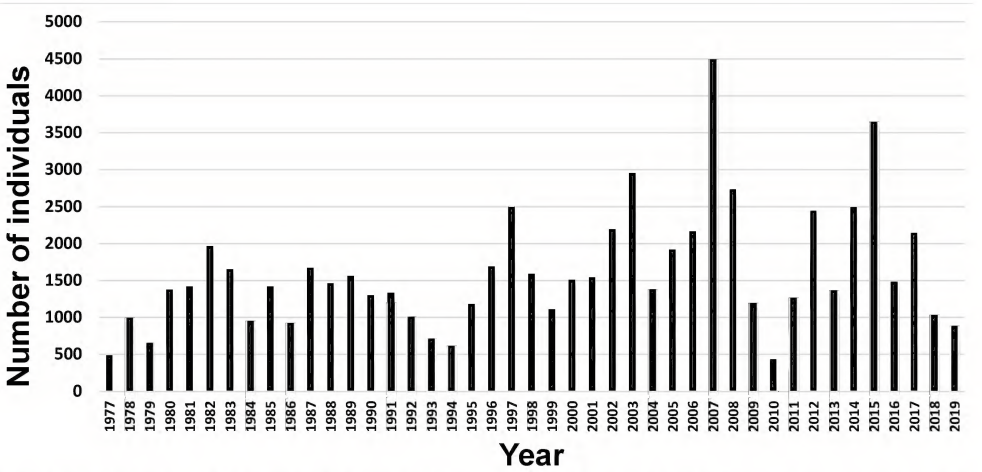

Figure 2. Yearly totals of the number of individual rodents captured at a long-term ecological study site in the Chihuahuan desert ecosystem near Portal, Arizona, that has spanned over 40 years beginning in 1977 (Ernest et al. 2020).

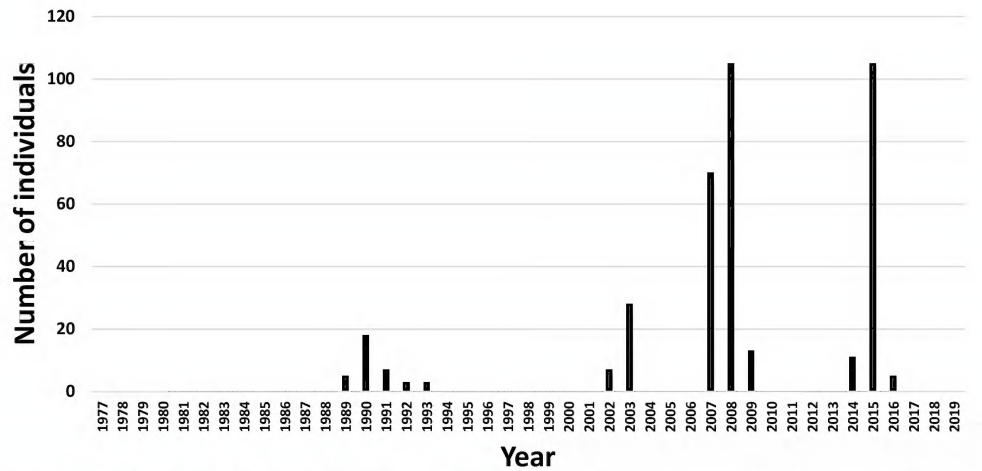

Figure 3. Yearly totals of the Tawny-bellied Cotton Rat (*Sigmodon fulviventer*) captured at a long-term ecological study site in the Chihuahuan desert ecosystem near Portal, Arizona, 1977–2019 (Ernest et al. 2020).

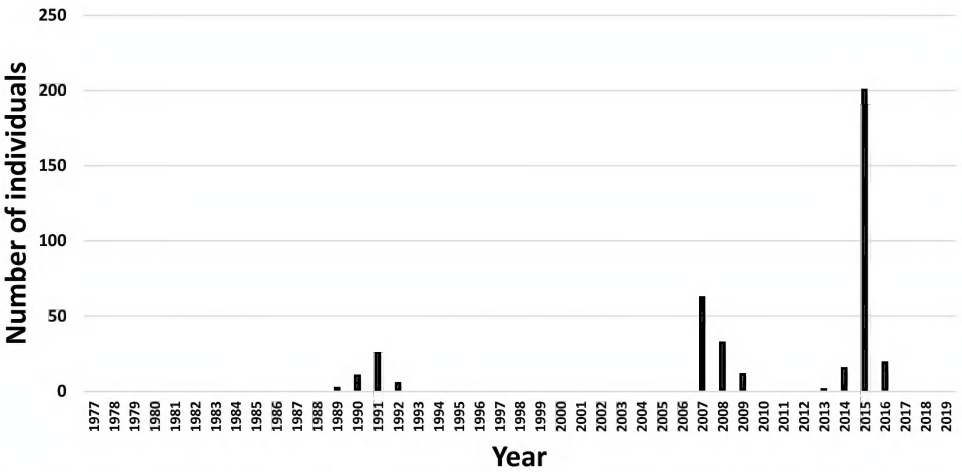

Figure 4. Yearly totals of the Northern Pygmy Mouse (*Baiomys taylori*) captured at a long-term ecological study site in the Chihuahuan desert ecosystem near Portal, Arizona, 1977–2019 (Ernest et al. 2020).

of *S. fulviventer* reported herein are still best referred to as range extensions.

It is unclear whether *S. fulviventer* only inhabits these northernmost areas when populations are at high densities or whether the species has continued to exist at low densities only in the most suitable habitats over long periods of time. The limited data reported herein are unable to support either conclusion, as this is beyond the scope of the study. The yearly or cyclic ebb and flow of distributional edges of species is not a new concept (see Frey 2009), but regional long-term data on fluctuations in rodent populations can assist in understanding distributional limits and help explain why species might not always occur within known ranges shown on maps. In other words, researchers might fail to detect the occurrence of a species in its distributional limit when in fact it occurs in the area only cyclically, irregularly, or temporarily. The fortuitous documentation of *S. fulviventer* and other species during a period of high density in this study will assist in interpreting future distributional data for grassland species in the region.

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LITERATURE CITED

Baker, R. H. 1969. Cotton rats of the *Sigmodon fulviventer* group. Pp. 177–232 in Contributions in mammalogy: a volume honoring Professor E. Raymond Hall (J. K. Jones, Jr., ed.). Miscellaneous Publication, University of Kansas Museum of Natural History 51:1–428.

Baker, R. H., and K. A. Shump, Jr. 1978. Sigmodon fulviventer. Mammalian Species 94:1–4.

Bradley, R. D., L. K. Ammerman, R. J. Baker, L. C. Bradley, J. A. Cook, R. C. Dowler, C. Jones, D. J. Schmidly, F. B. Stangl, Jr., R. A. Van Den Bussche, and B. Würsig. 2014. Revised checklist of North American mammals north of Mexico, 2014. Occasional Papers, Museum of Texas Tech University 327:1–27.

Cameron, G. N., and S. R. Spencer. 1981. Sigmodon hispidus. Mammalian Species 158:1–9.

Cook, J. A. 1986. The mammals of the Animas Mountains and adjacent areas, Hidalgo County, New Mexico. Occasional Papers, The Museum of Southwestern Biology 4:1–45.

Dunnum, J. L., J. K. Frey, D. S. Tinnin, J. Salazar-Bravo, and T. L. Yates. 2002. Elevational range extension for the Hispid Cotton Rat, *Sigmodon hispidus*, (Rodentia: Muridae). The Southwestern Naturalist 47:637–639.

Ernest, S. K. M., G. M. Yenni, G. Allington, E. K. Bledsoe, E. M. Christensen, R. M. Diaz, J. R. Goheen, Q. Guo, E. Heske, D. Kelt, J. M. Meiners, J. Munger, C. Restrepo, D. A. Samson, M. R. Schutzenhofer, M. Skupski, S. R. Supp, K. Thibault, S. Taylor, E. White, D. W. Davidson, J. H. Brown, and T. J. Valone. 2020. The Portal project: a long-term study of a Chihuahuan desert ecosystem. https://www.biorxiv.org/content/10.1101/332783v3

Findley, J. S., A. H. Harris, D. E. Wilson, and C. Jones. 1975. Mammals of New Mexico. University of New Mexico Press, Albuquerque, New Mexico.

Frey, J. K. 2009. Distinguishing range expansions from previously undocumented populations using background data from museum records. Diversity and Distributions 15:183–187.

Geluso, K. 2009a. Distributional records for seven species of mammals in southern New Mexico. Occasional Papers, Museum of Texas Tech University 287:1–7.

Geluso, K. 2009b. Records of the Yellow-nosed Cotton Rat (*Sigmodon ochrognathus*) in southwestern New Mexico. Western North American Naturalist 69:548–550.

Geluso, K. 2016. Mammals of the active floodplains and surrounding areas along the Gila and Mimbres rivers, New Mexico. Final report submitted to the New Mexico Department of Game and Fish, Santa Fe, New Mexico. 166 pp.

Geluso, K., K. N. Geluso, and B. R. Andersen. 2017. Distribution of the Northern Pygmy Mouse (*Baiomys taylori*) in southwestern New Mexico, with notes on reproduction. Occasional Papers, Museum of Texas Tech University 349:1–9.

Geluso, K., J. D. Hoffman, V. A. Ashe, J. A. White, and M. A. Bogan. 2005. Westward expansion of the Tawny-bellied Cotton Rat (*Sigmodon fulviventer*) in west-central New Mexico. The Southwestern Naturalist 50:273–277.

Geluso, K. N., and K. Geluso. 2020. New distributional records and observations of natural history for the Yellow-nosed Cotton Rat (*Sigmodon ochrognathus*) in southwestern New Mexico. Occasional Papers, Museum of Texas Tech University 362:1–21.

Hoffmeister, D. F. 1986. Mammals of Arizona. University of Arizona Press and Arizona Game and Fish Department, Tucson, Arizona.

Mohlhenrich, J. S. 1961. Distribution and ecology of the Hispid and Least Cotton Rats in New Mexico. Journal of Mammalogy 42:13–24.

Petersen, M. K. 1973. Interactions between the cotton rats, *Sigmodon fulviventer* and *S. hispidus*. The American Midland Naturalist 90:319–333.

Rehmeier, R. L., G. A. Kaufman, D. W. Kaufman, and B. R. McMillan. 2005. Long-term study of the abundance of the Hispid Cotton Rat in native tallgrass prairie. Journal of Mammalogy 86:670–676.

Schmidly, D. J., and R. D. Bradley. 2016. The mammals of Texas. Seventh edition. The University of Texas Press, Austin, Texas.

Stuart, J. N., and N. J. Scott, Jr. 1992. Range extension of the Northern Pygmy Mouse, *Baiomys taylori*, in New Mexico. The Texas Journal of Science 44:487–489.

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APPENDIX

Localities of occurrence for the Tawny-bellied Cotton Rat (*Sigmodon fulviventer*) in southwestern New Mexico. Site numbers (in bold) refer to Figure 1. Elevations (elev.) of capture sites were determined by plotting coordinates on Google Earth. Voucher specimens were deposited in the Museum of Southwestern Biology (MSB), University of New Mexico, Albuquerque. Reproductive information and body weights in grams (g) are given if data were recorded. Total trap nights for each site are given along with other species of rodents captured in trap lines with *S. fulviventer*. Trap nights are given only for those nights that individuals of *S. fulviventer* were captured at a site.

Catron County:

(1) 11.9 km S, 3.4 km E Glenwood, 33.20914°N, 108.84198°W, elev. 1,470 m: 25 November 2015 (1 adult female [MSB 326287, 89 g, no embryos]); 15 February 2016 (1 male [MSB 326288, 44.5 g, testis 6 x 4 mm in length]); 20 March 2016 (1 adult male [96 g]); and 26 April 2016 (1 adult male [102g], 1 juvenile male [MSB 326289, 16 g, testis 4 x 2 mm]), and 2 adult females [77 and 92 g]). Other species captured at this site with *S. fulviventer* included *R. megalotis* (*n* = 15), *S. ochrognathus* (11), *P. leucopus* (6), *N. albigula* (5), *O. torridus* (3), *P. maniculatus* (2), and *P. leucopus*/*maniculatus* (2). Trap nights = 160.

Grant County:

(2) 17.4 km N, 11.2 km W Buckhorn, 33.19465°N, 108.83078°W, elev. 1,550 m: 10 January 2017 (1 female [59 g]). Other species captured at this site with *S. fulviventer* included *R. megalotis* (5), *S. ochrognathus* (3), and *P. boylii* (1). Trap nights = 20.

(3) The Nature Conservancy North Mimbres Property, 4.7 km N, 1.3 km W Mimbres, 32.89900°N, 107.99472°W, elev. 1,862: 10 June 2014 (1 adult female and 3 unknown sex); and 11 June 2014 (1 adult male, 3 adult females, 1 juvenile female, and 1 adult unknown sex). Other species captured at this site with *S. fulviventer* included *R. megalotis* (9), *and P. boylii* (5). Trap nights = 30.

(4) The Nature Conservancy North Mimbres Property, 4.7 km N, 1.3 km W Mimbres, 32.89889°N, 107.99482°W, elev. 1,859 m: 9 June 2014 (1 adult female [MSB 296447, 139 g, 4 fetuses, crown-rump length = 33 mm]); and 10 June 2014 (1 adult male, 1 juvenile female, and 1 unknown sex). Other species captured at this site with *S. fulviventer* included *P. flavus* (16), *R. megalotis* (8), and *P. boylii* (2). Trap nights = 50.

(5) The Nature Conservancy North Mimbres Property, 0.8 km N, 0.2 km E Bear Canyon Reservoir spillway, 32.89037°N, 107.99095°W, elev. 1,845: 19 May 2015 (3 adult males [61 and 79 g]). Other species captured at this site with *S. fulviventer* included *R. megalotis* (10), *P. boylii* (5), *P. leucopus* (2), *N. mexicana* (2), *N. albigula* (1), and *S. hispidus* (1). Trap nights = 80.

Luna County:

(6) River Ranch NMDGF (New Mexico Department of Game and Fish), 4.1 km S, 4.4 km W Faywood, 32.58915°N, 107.91711°W, elev. 1,540 m: 4 June 2015 (1 adult female [MSB 296507, 121 g, 6 fetuses, crown-rump length = 21 mm], 1 adult male [98 g], and 1 adult unknown sex [106 g]); and 24 March 2016 (1 adult male). Other species captured at this site with *S. fulviventer* included *R. megalotis* (5), *B. taylori* (2), *P. leucopus* (1), and *S. hispidus* (1). Trap nights = 80.

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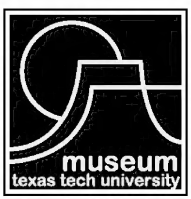

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